

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

RIPARIAN FOREST BUFFER

(Acre)

CODE 391

DEFINITION

An area of trees and/or shrubs located adjacent to and up-gradient from water bodies.

PURPOSES

Create shade in order to lower water temperatures and improve habitat for aquatic organisms.

Provide a source of detritus and large woody debris for aquatic organisms, biological diversity, habitat, and corridors for wildlife.

Reduce excessive amounts of sediment, organic material, nutrients, and pesticides in surface runoff and reduce excessive nutrients and other chemicals in shallow ground water flow.

Timber production in selected areas, e.g., lumber, firewood, and posts.

Improve streambank stability, decrease velocity of stream flow during flooding, mitigate flood damage, and flatten flood peaks.

CONDITIONS WHERE PRACTICE APPLIES

On areas adjacent to permanent or intermittent streams, lakes, ponds, wetlands, and areas with ground water recharge.

CRITERIA

General Criteria Applicable to All Purposes Named Above

The location, layout and, density of the riparian forest buffer will accomplish the intended purpose and function. The buffer will consist of a zone (identified as zone 1 in Figure 1) that begins at the water line, or at the top of the bank, and extends a minimum distance of 15 feet, measured horizontally on a line perpendicular to the water body. It is important to note that zone widths are a minimum and can be extended to address individual planning site conditions, for example aligning field boundaries.

Dominant vegetation will consist of existing or planted trees and shrubs suited to the site and the intended purpose. Occasional removal of some tree and shrub products such as high value trees is permitted provided the intended purpose is not compromised by the loss of vegetation or harvesting disturbance.

Necessary site preparation and planting shall be done at a time and manner to ensure survival and growth of selected species. Only viable, high quality, and adapted planting stock will be used. Site preparation shall be sufficient for establishment and growth of selected species and shall be done in a manner that does not compromise the intended purpose.

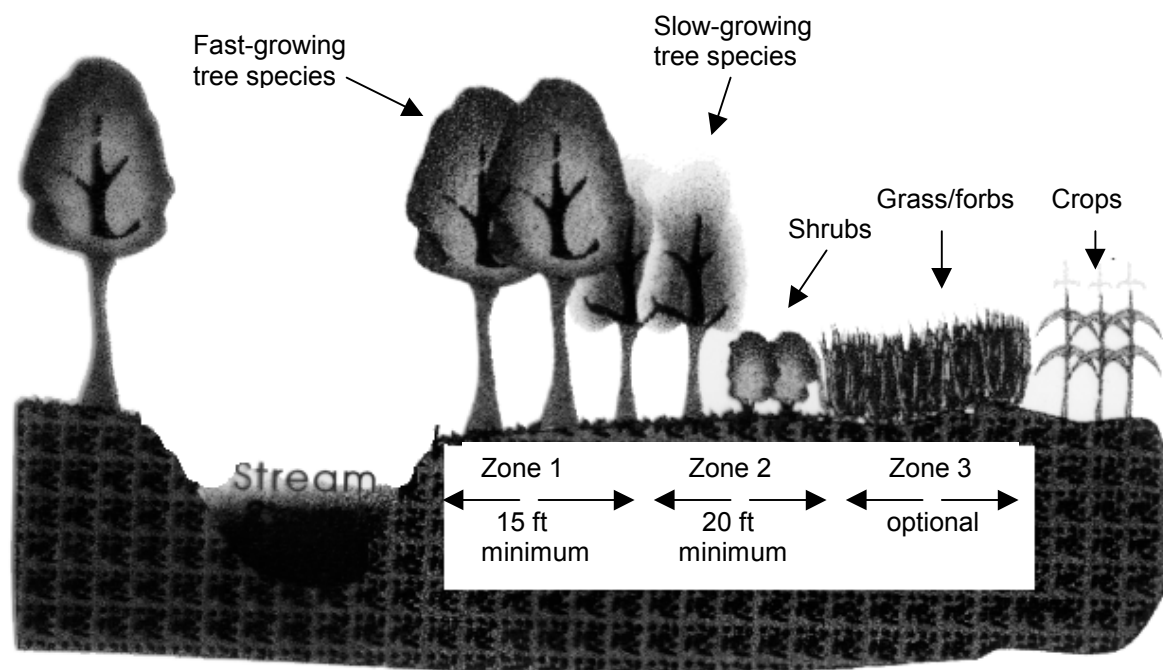


Figure 1 - Riparian forest buffer zones

Where native seed sources are adequate and in consideration of the specific purpose of the riparian buffer, natural regeneration can be considered. Seedlings, natural regeneration, live cuttings, and direct seeding are all accepted methods for establishment of this practice.

Livestock shall be controlled or excluded as necessary to achieve and maintain the intended purpose.

Harmful pests present on the site will be controlled as necessary to achieve and maintain the intended purpose.

Additional Criteria to Reduce Excessive Amounts of Sediment, Organic Material, Nutrients, and Pesticides in Surface Runoff and Reduce Excessive Nutrients and Other Chemicals in Shallow Ground Water Flow

An additional area of land, zone 2, will begin at the edge and up-gradient of zone 1 and extend

a minimum distance of 20 feet, measured horizontally on a line perpendicular to the water body. The minimum combined width of zones 1 and 2 will be 100 feet or 30 percent of the geomorphic flood plain, whichever is less but not less than 35 feet. Figure 2 illustrates examples of zone 1 and zone 2 widths for watercourses and water bodies. Criteria for zone 1 shall apply to zone 2 except that removal of tree and shrub products such as timber, nuts, and fruit is permitted on a periodic and regular basis provided the intended purpose is not compromised by loss of vegetation or harvesting disturbance.

Concentrated flow erosion or mass soil movement shall be controlled in the up-gradient area immediately adjacent to zone 2 prior to establishment of the riparian forest buffer. This area is delineated and identified as zone 3. Zone 3 shall be designed in accordance with criteria in Conservation Practice Standard 393, Filter Strip, and should most often contain a mixture of native grass and forbs. See Figure S-2 in the specifications.

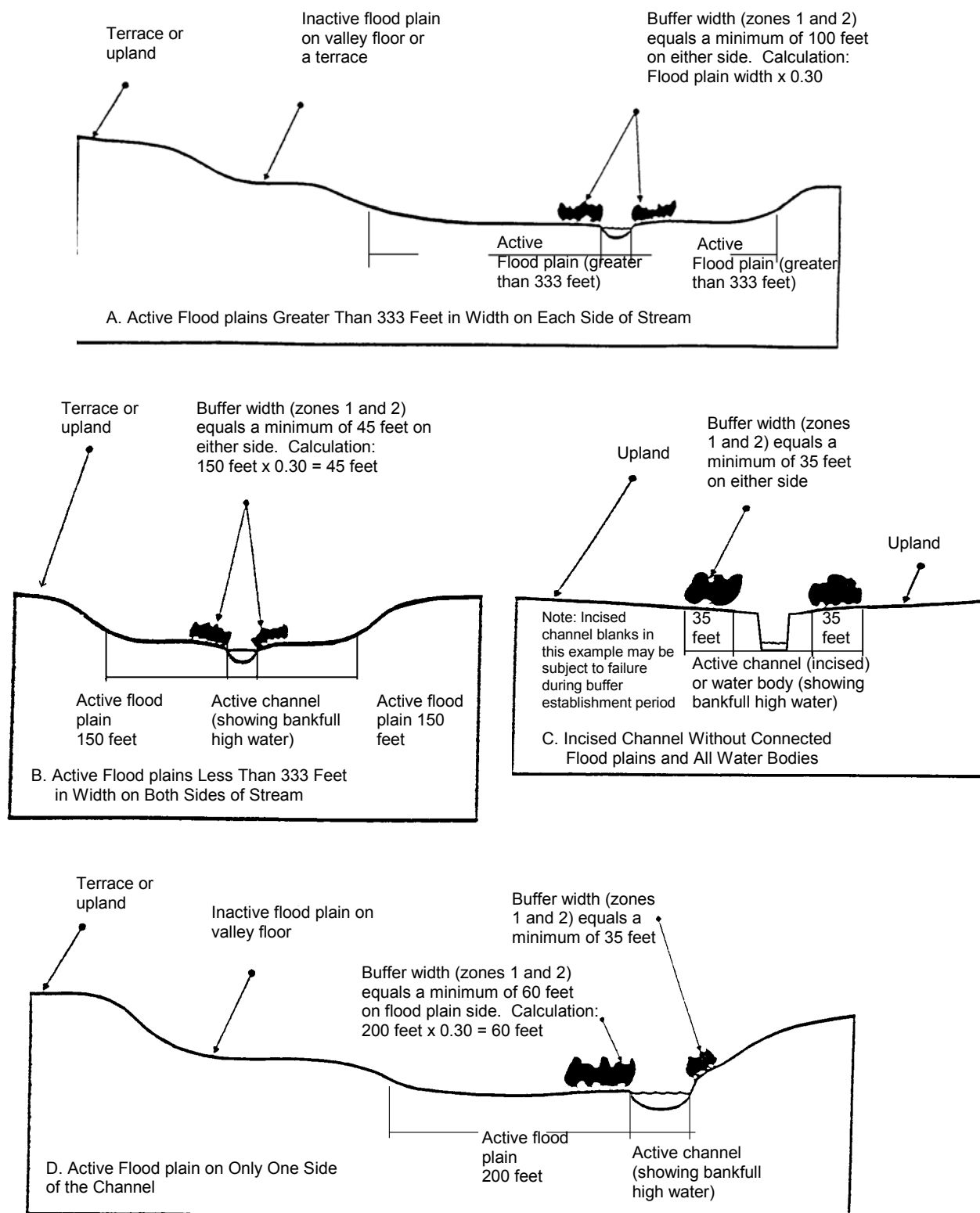


Figure 2 - Examples of riparian forest buffer widths for watercourses and water bodies

CONSIDERATIONS

The severity of bank erosion and its influence on existing or potential riparian trees and shrubs should be assessed. Watershed-level treatment or bank stability activities may be needed before establishing a riparian forest buffer. After analyzing channel evolution, bank materials, and watershed characteristics, establish the riparian buffer an estimated distance from the bank and establish grass and forbs in zone 1.

Where ephemeral, concentrated flow erosion and sedimentation is a concern, the application of a vegetated strip consisting of grasses and forbs should be established in zone 3.

When concentrated flow erosion and sedimentation cannot be controlled vegetatively, consider a combination of structural or mechanical treatments with vegetative plantings.

Favor tree and shrub species that are native and have multiple values such as those suited for timber, biomass, nuts, fruit, browse, nesting, and aesthetics.

Avoid tree and shrub species that may be alternate hosts to undesirable pests. Species diversity should be considered to avoid loss of function due to species-specific pests and to maximize biological diversity at the site and landscape level.

Woody phreatophytes and hydrophytes that deplete ground water should not be used.

The location, layout, and density of the buffer should compliment natural features.

PLANS AND SPECIFICATIONS

Specifications for this practice shall be prepared for each site. Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

OPERATION AND MAINTENANCE

The following actions shall be carried out to ensure that this practice functions as intended throughout its expected life. These actions include normal repetitive activities in the application and use of the practice (operation) and repair and upkeep of the practice (maintenance).

The riparian forest buffer will be inspected periodically to determine plant survival and protected to maintain the intended purpose from adverse impacts such as excessive vehicular and pedestrian traffic, pest infestations, pesticide use, livestock damage, and fire.

Replacement of dead trees or shrubs and control of undesirable vegetative competition will be continued until the buffer is, or will progress to, a fully functional condition. Consideration will be given to retaining dead snags for wildlife habitat.

As applicable, control of concentrated flow erosion or mass soil movement shall be continued in zone 3 to maintain buffer function.

Any removals of tree and shrub products shall be conducted in a manner that maintains the intended purpose.

Any use of fertilizers, pesticides, and other chemicals to assure buffer function shall not compromise the intended purpose.